REMARKS

In response to the Office Action mailed May 19, 2005, Applicants respectfully request reconsideration. To further the prosecution of this Application, Applicants submit the following remarks, have canceled claims and have added new claims. The claims as now presented are believed to be in allowable condition.

Claims 1-14, 18-31 and 35-41 were pending in this Application. By this Amendment, claims 35-40 have been canceled. Claims 42-44 have been added. Accordingly, claims 1-14, 18-31 and 41-44 are now pending in this Application. Claims 1, 18 and 41 are independent claims.

Preliminary Matters

Applicant wishes to thank Examiner Taylor for the courtesies provided during a telephone interview on August 11, 2005. During this interview, Applicants' Representative, David E. Huang, pointed out that it was somewhat difficult for Applicants to understand why, in connection the prior art rejection of with claim 1 under 35 USC 103, someone would want to combine a switch as disclosed in U.S. Patent No. 6,421,753 (Hoese et al.) in a system disclosed in U.S. Patent No. (Papa et al.) as contended in the Final Office Action. Mr. Huang further pointed out, in connection with the prior art rejection of dependent claims 35-37 under 35 USC 103, his concern over why someone would then further want to combine a loop back multiplexer 34 disclosed within U.S Patent No. 6,260,092 (Story et al.). In particular, there does not seem to be any motivation to combine or any likelihood of success if combined since the individual benefits provided by each reference would not seem to survive in the eventual combination.

Among other things, Mr. Huang respectfully pointed out that the proposed combination of these three references was an unreasonable stretch since addition of the Hoese switch would not further allow the ability to centralize local storage for networked workstations and accessing virtual storage as if it were

local as contended by the Office Action in paragraph 7. Admittedly, Hoese provides the language quoted by the Office Action, but inclusion of the Hoese switch would clearly not add such functionality into the Papa system as contended by the Office Action on the last paragraph of page 4. Moreover, inclusion of the Story multiplexer 34 would certainly not improve bandwidth and provide further connectivity to buses of any Papa/Hoese combination as contended by the Office Action in paragraph 24.

In response to the comments from Mr. Huang, Examiner Taylor said that he would not reconsider the rejections of claims 1 and 35-37 if Applicants were to simply file a Response to the Final Office Action. However, Examiner Taylor agreed to reconsider the rejections of such claims in view of Applicants arguments if Applicants filed a Request for Continued Examination (RCE).

Rejections under §102 and §103

Claims 37, 40 and 41 were rejected under 35 U.S.C. §103 as being unpatentable over Papa, Hoese and Story. Applicants respectfully traverse the rejections of these claims and request reconsideration.

To further the prosecution of this Applicant, Applicants have amended claim 1 to include all of the limitations of claims 35-37 and then canceled claims 35-37. Additionally, Applicants have amended claim 18 to include all of the limitations of claims 38-40 and then canceled claims 38-40.

Papa discloses a computer system having a cabinet 101 housing a rack 102, a display monitor 173A resting on a shelf 173B, a retractable keyboard 174, a variable number of storage devices 106 mounted onto shelves 172, a CD-ROM module 108, a computer system which is mounted in a chassis 170 (column 3, line 61 through column 4, line 12). The Papa computer system is constructed in a modular fashion, including a CPU module 103, a plurality of network interface modules 104, and a plurality of power modules 105 (column 4, lines 12-15). Faults in individual modules may be isolated and repaired without disrupting the operation of the remainder of the server 100 (column 4, lines 15-17). The Papa

computer system further includes a system board 182, a backplane board 184 which is interconnected with the system board 182, and canisters 258, 260, 262, and 264 which interconnect with the backplane board (column 4, lines 18-24). PC buses 250, 252, 254, and 256 connect respectively to the canisters 258, 260, 262, and 264 which are casings for a detachable bus system and provide multiple slots for adapters (column 4, lines 44-54). The backplane printed circuit board 184 has high density connectors 413, 415, 417 and 419 which connect to corresponding network interface modules 104 (column 7, lines 7-15). Fig. 5B of Papa shows the rear side of the backplane printed circuit board 184, connectors 421 that connect to connectors of the power modules 105, and the 413, 415, 417 and 419 (column 7, lines 26-33). Interface cards may be slipped into or removed from interface card slots 562 when a canister 560 is removed from its shelf 175B or 175C in the chassis 170 (column 8, lines 30-32). An interface card slot 562 may be empty or may be filled with a general interface card such as a network interface card (NIC), a local area network (LAN) card, or a small computer system interface (SCSI) controller card (column 8, lines 32-41).

Hoese discloses centralization of local storage for networked workstations without any cost of speed or overhead (column 2, lines 25-27). Each workstation accesses its virtual local storage as if it were locally connected (column 2, lines 27-29). Further, the centralized storage devices can be located in a significantly remote position even in excess of ten kilometers as defined by Fibre Channel standards (column 2, lines 29-31). Along these lines, a Fibre Channel high speed serial transport 32 interconnects a plurality of workstations 36 and storage devices 38 (column 3, 30-38 and Fig. 2). A storage router 44 then serves to interconnect these mediums and provide devices on either medium global, transparent access to devices on the other medium (column 3, lines 38-40). Storage router 44 routes requests from initiator devices on one medium to target devices on the other medium and routes data between the target and the initiator (column 3, lines 41-44).

Story discloses a Serial Interface 10 for a point-to-point or ring connectable bus bridge 50 (column 2, lines 58-59 and Figs. 1 and 2). The Serial Interface 10 produces a digital signal that alternates in average polarity by two bits per frame between +1 and -1 (column 3, lines 20-23). A Frame Formatter 26 produces control and timing signals to input a byte to an Encoder 24 and output a 10 bit word to a Serial Layer 30 (column 3, lines 23-26 and Fig.1). The Serial Layer 30 contains a Differential Input 36 which receives a serial signal from the serial output of other Bus Bridges 50 or other serially connected devices and outputs it to a Loop Back Multiplexer 34 (column 3, lines 27-32 and Fig. 2). The Loop Back Multiplexer 34 is used to test the performance of the link by "looping back" the data stream without producing an output from the Differential Output 40 (column 3, lines 32-36). The Differential Input 36, when selected by the Loop Back Multiplexer 34, outputs serial data to the Serial to Parallel Converter 32 which produces a ten bit word input to an Error Detection and Link Generation block 12 (column 3, lines 36-40). The output of each Serial Interface 30 inputs the input of the next Interface 30 in the chain and so forth (column 7, lines 45-55 and Figs. 3A and 3B).

Claims 1-14 and 35-37

Applicants amended claim 1 so that it includes all of the limitations of claims 35-37, and then canceled claims 35-37.

Claim 1, as amended, is directed to a network adapter that may be used in a network data storage system to permit data communication among data exchanging devices and a data storage system input/output (I/O) controller. The controller resides in the data storage system. The data exchanging devices are external to the adapter. The adapter includes one or more interfaces that may be coupled to an electrical backplane of the system. The backplane is coupled to the controller and being configured to permit communication between the controller and the adapter when the one or more interfaces are coupled to the backplane. The adapter further includes a switching system integrated into the

adapter. The switching system has a first set of ports that may be coupled to the data exchanging devices and a second set of ports that may couple the switching system to the controller when the one or more interfaces are coupled to the backplane. The switching system is configured to selectively provide one of (i) communications between the controller and the data exchanging devices through the first and second sets of ports, and (ii) a test loop which loops the second set of ports back to the controller to enable the controller to diagnostically test controller operation and connectivity between the controller and the adapter through the backplane using a set of test vectors through the second set of ports. The switching system is further configured to isolate the controller from the data exchanging devices to avoid escape of signals from the controller to the data exchanging devices when the switching system selectively provides the test loop. The controller is a single circuit board having multiple Fibre Channel interfaces. The switching system is configured to daisy chain the multiple Fibre Channel interfaces of the single circuit board together exclusive of the data exchanging devices when the switching system selectively provides the test loop.

The cited prior art does not teach or suggest, either alone or in combination, an adapter that may be used in a network data storage system having a switching system configured to daisy chain multiple Fibre Channel interfaces of a single circuit board together exclusive of data exchanging devices when the switching system selectively provides a test loop, as recited in claim 1. Rather, Story, which was cited as arguably disclosing looping back of a test vector, discloses daisy chaining individual separated Bus Bridges 50 (e.g., see Figs. 3A and 3B and column 7, lines 45-55 of Story). There is no single circuit board shown. Moreover, it is unclear why would want to dispose each of the individual separated Bus Bridges 50 on a single circuit board and then provide a test loop since the purpose of Story's test loop is to test connectivity (e.g., see the Office Action's contention on page 10, lines 10-11). If the Story Bus Bridges 50 were already on a single circuit board there would be no reason to check connectivity because they would already be connected.

For the reasons stated above, claim 1 patentably distinguishes over the cited references. Accordingly, the rejection of claim 1 under 35 USC 103 should be withdrawn and claim 1 is in allowable condition.

Because claims 2-14 depend from and further limit claim 1, claims 2-14 are in allowable condition for at least the same reasons.

Claims 18-31 and 38-40

Applicants amended claim 18 so that it includes all of the limitations of claims 38-40, and then canceled claims 38-40.

Claim 18, as amended, is directed to a method of using a network adapter in a network data storage system to permit data communication among data exchanging devices and a data storage system input/output (I/O) controller. The controller resides in the data storage system. The data exchanging devices are external to the adapter. The adapter includes one or more interfaces and a switching system. The method includes coupling the one or more interfaces to an electrical backplane of the system. The backplane is coupled to the controller and being configured to permit communication between the controller and the adapter when the one or more interfaces are coupled to the backplane. The method further includes coupling a first set of ports of the switching system to the data exchanging devices, coupling a second set of ports of the switching system to the controller, and selectively providing one of (i) communications between the controller and the data exchanging devices through the first and second sets of ports, and (ii) a test loop which loops the second set of ports back to the controller to enable the controller to diagnostically test controller operation and connectivity between the controller and the adapter through the backplane using a set of test vectors through the second set of ports. Selectively providing the test loop includes isolating the controller from the data exchanging devices to avoid escape of signals from the controller to the data exchanging devices. The controller is a single circuit board having multiple Fibre Channel interfaces, and

isolating includes daisy chaining the multiple Fibre Channel interfaces of the single circuit board together exclusive of the data exchanging devices.

As mentioned above in connection with claim 1, the cited references do not teach or suggest, either alone or in combination, a method of using a network adapter in a network data storage system which involves daisy chaining multiple Fibre Channel interfaces of a single circuit board together exclusive of the data exchanging devices, as recited in claim 18. Accordingly, claim 18 patentably distinguishes over the cited prior art and the rejection of claim 18 under 35 USC 103 should be withdrawn. Thus, claim 18 is in allowable condition.

Because claims 19-31 depend from and further limit claim 18, claims 19-31 are in allowable condition for at least the same reasons.

Claim 41

Claim 41 is directed to a network adapter configured to permit data communication among data exchanging devices and a data storage system input/output (I/O) controller of a network data storage system. The controller resides in the data storage system. The data exchanging devices are external to the data storage system. The network adapter includes adapter interfaces configured to couple to an electrical backplane of the network data storage system. The electrical backplane is coupled to the controller and is configured to permit communication between the controller and the adapter when the adapter interfaces couple to the electrical backplane. The network adapter further includes a switching subsystem coupled to the adapter interfaces. The switching subsystem has a first set of ports configured to couple to the data exchanging devices and a second set of ports configured to couple to the controller when the adapter interfaces couple to the electrical backplane. The switching subsystem is configured to selectively provide one of (i) communications between the controller and the data exchanging devices through the first and second sets of ports, and (ii) a test loop which loops the second set of ports back to the controller to enable the controller to diagnostically test controller operation and

connectivity between the controller and the adapter through the backplane using a set of test vectors through the second set of ports. The switching subsystem is further configured to isolate the controller from the data exchanging devices to avoid escape of signals from the controller to the data exchanging devices when the switching subsystem selectively provides the test loop. The controller is a single circuit board having multiple Fibre Channel interfaces. The switching subsystem is further configured to daisy chain the multiple Fibre Channel interfaces of the single circuit board together exclusive of the data exchanging devices when the switching subsystem selectively provides the test loop.

As mentioned above in connection with claim 1, the cited references do not teach or suggest, either alone or in combination, a network adapter configured to permit data communication among data exchanging devices and a data storage system input/output (I/O) controller of a network data storage system which includes a switching subsystem configured to daisy chain multiple Fibre Channel interfaces of a single circuit board together exclusive of data exchanging devices when the switching subsystem selectively provides a test loop, as recited in claim 41.

For the reasons stated above, claim 41 patentably distinguishes over the cited prior art and the rejection of claim 41 under 35 USC 103 should be withdrawn. Thus, claim 41 is in allowable condition.

Newly Added Claims

Claims 42-44 have been added and are believed to be in allowable condition. Claim 42 depends from claim 1. Claim 43 depends from claim 18. Claim 44 depends from claim 41. Support for claims 42-44 is provided within the Specification, for example, on page 9, line 21 through page 12, line 7. No new matter has been added.

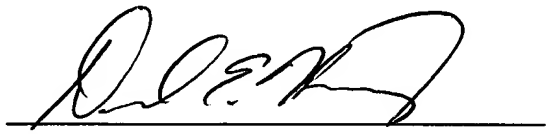
Conclusion

In view of the foregoing remarks, this Application should be in condition for allowance. A Notice to this affect is respectfully requested. If the Examiner believes, after this Amendment, that the Application is not in condition for allowance, the Examiner is respectfully requested to call the Applicant's Representative at the number below.

Applicants hereby petition for any extension of time which is required to maintain the pendency of this case. If there is a fee occasioned by this Amendment, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 50-0901.

If the enclosed papers or fees are considered incomplete, the Patent Office is respectfully requested to contact the undersigned collect at (508) 366-9600, in Westborough, Massachusetts.

Respectfully submitted,



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